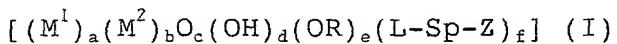


Patent Claims

1. Dental material containing a cluster according to the general formula



in which

$M^1$ ,  $M^2$  independently of each other, stand for a metal atom of the IIIrd or Vth main groups or the 1st to VIIth sub-groups of the periodic table;

$R$  is an alkyl group with 1 to 6 carbon atoms;

$L$  is a co-ordinating group with 2 to 6 complexing centres;

$Sp$  is a spacer group or is absent;

$Z$  is a polymerizable group;

$a$  is a number from 1 to 20;

$b$  is a number from 0 to 10;

$c$  is a number from 1 to 30;

$d$ ,  $e$  independently of each other, are in each case a number from 0 to 30;

$f$  is a number from 2 to 30,

any charge of the cluster (I) present being equalized by counterions.

2. Dental material according to claim 2, characterized in that the variables have the following meanings:

$M^1$ ,  $M^2$  = independently of each other, Ti and/or Zr;

$R$  = an alkyl group with 1 to 4 carbon atoms, in particular 1 to 2 carbon atoms;

$L$  =  $\alpha$ -hydroxycarboxylate ( $-\text{CH}(\text{OH})-\text{COO}^-$ ),

$\alpha$ -aminocarboxylate ( $-\text{CH}(\text{NH}_2)\text{-COO}^-$ ),  
 $\beta$ -diketonate ( $[-\text{C}(-\text{O}^-)=\text{CH-C}(=\text{O})\text{R}^{\text{K}}]$ );  
with  $\text{R}^{\text{K}}$  = alkyl, preferably  $\text{C}_1$  to  $\text{C}_6$   
alkyl, particularly preferably  $\text{C}_1$  to  
 $\text{C}_3$  alkyl, in particular methyl,  
sulfonate ( $-\text{SO}_3^-$ ) or phosphonate  
( $-\text{PO}_3^{2-}$ ), particularly preferably  
carboxylate ( $-\text{COO}^-$ );

Sp = an alkylene group with 1 to 18  
carbon atoms, an oxyalkylene group with  
1 to 18 carbon atoms and 0 to 6 oxygen  
atoms or an arylene group with 6 to 14  
carbon atoms, the spacer Sp being able  
to contain one or more, preferably 0 to  
2 of the groups O, S, CO-O, O-CO, CO-  
NH, NH-CO, O-CO-NH, NH-CO-O and NH;  
particularly preferably, Sp is an  
alkylene group with 1 to 6, in  
particular 1 to 3 carbon atoms or is  
absent;

Z = an ethylenically unsaturated group,  
an epoxide, oxetane, vinyl ether,  
1,3-dioxolane, spiroorthoester,  
particularly preferably a methacrylic  
and/or acrylic group;

a = 2 to 11;

b = 0 to 4.

3. Dental material according to claim 2 or 3,  
characterized in that L-Sp-Z stands for acrylate,  
methacrylate, oleate, allyl acetoacetate and/or  
acetoacetoxyethyl methacrylate.

4. Dental material according to one of claims 2 to  
4, characterized in that the clusters 1 to 4  
contain kinds of ligands of the type L-Sp-Z.

5. Dental material according to one of claims 2 to 5, characterized in that the cluster has a monodisperse mass distribution.

6. Dental material according to claim 2 or 6, characterized in that the indices c to f assume values such that the positive charges of the metal or metals are completely equalized.

7. Dental material according to one of claims 2 to 7, characterized in that  $M^1$  is equal to  $M^2$ .

8. Dental material according to one of claims 2 to 8, characterized in that it contains one or more further polymerizable components.

9. Dental material according to claim 9, characterized in that the further polymerizable component is a polymerizable polysiloxane, an ionically and/or radically polymerizable organic monomer or a mixture thereof.

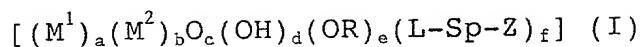
10. Dental material according to one of claims 2 to 10, characterized in that it contains an initiator for ionic and/or radical polymerization, filler and/or further additives.

11. Dental material according to one of the previous claims, characterized in that it contains, relative to its overall mass

- (a) 5 to 90% wt.-% of at least one cluster according to formula (I),
- (b) 10 to 90 wt.-% of a further polymerizable component,
- (c) 0.1 to 5.0 wt.-% polymerization initiator, and

(d) 0 to 90 wt.-% wt.-% filler.

12. Use of a cluster of the general formula



in which

$M^1$ ,  $M^2$  independently of each other, stand for a metal atom of the IIIrd or Vth main groups or the I<sup>st</sup> to VII<sup>th</sup> sub-groups of the periodic table;

R is an alkyl group with 1 to 6 carbon atoms;

L is a co-ordinating group with 2 to 6 complexing centres;

Sp is a spacer group or is absent;

Z is a polymerizable group;

a is a number from 1 to 20;

b is a number from 0 to 10;

c is a number from 1 to 30;

d, e independently of each other, are in each case a number from 0 to 30;

f is a number from 2 to 30,

any charge of the cluster (I) present being equalized by counterions, as dental material or for the preparation of a dental material.

13. Use according to claim 12 as adhesive, coating material, cement or filling material.

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